

**REMARKS**

Reexamination and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.112, and in light of the remarks which follow, are respectfully requested.

Claim 1 has been amended to include the upper limit of the Na<sub>2</sub>O range set forth in Claim 2. As such, no new issues are presented and entry of the amendment to Claim 1 is deemed appropriate under 37 C.F.R. §1.116.

The various issues raised in the Official Action are discussed in the order in which they appear in the Official Action.

The withdrawal of the previous rejections of Claims 1-15 under 35 U.S.C. §112, second and fourth paragraphs is gratefully acknowledged.

**The §102 Rejection**

Claims 1-5 and 13-15 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Goodboy. This rejection is respectfully traversed for the following reasons.

**Legal Standard of §102 Rejection**

In order to establish anticipation under §102(b), all elements of the claim must be found in a single reference. Hybritech, Inc. v. Monoclonal Antibodies, Inc., 231 USPQ 81, 90 (Fed. Cir. 1986), cert. denied, 107 S. Ct. 1606 (1987). In particular, as pointed out by the court in W.L. Gore & Assoc., Inc. v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1981), cert. denied, 469 U.S. 851 (1984), "anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference." In the

present case, Goodboy clearly fails to anticipate or render obvious the claimed subject matter.

### **The Invention**

The invention relates to novel catalysts for the purification/treatment of gases, especially of gaseous industrial effluents containing sulfur compounds, particularly to recover elemental sulfur therefrom, and more especially to novel catalysts for the Claus reaction and/or the hydrolysis of organic sulfur compounds (specification at page 1, lines 5-11). It has unexpectedly been determined that the extent of the sodium content of alumina is a primary factor in the deactivation thereof, especially by sulphate formation (specification at page 3, lines 11-14). According to the invention, a catalytically active alumina comprises sodium values wherein the sodium content of the alumina ranges from 1,200 to 2,500 ppm of  $\text{Na}_2\text{O}$  by weight thereof (specification at page 3, lines 19-26).

The figure of the drawing is a graph plotting the conversion of  $\text{CS}_2$  as a function of the  $\text{Na}_2\text{O}$  content in various alumina catalysts (specification at page 4, lines 2-4). In Example 2, catalysts having various  $\text{Na}_2\text{O}$  contents were prepared and the catalytic activity thereof was tested by contacting the catalysts with a gas having the composition set forth in the table on page 9 of the specification. As shown in the figure, the conversion of  $\text{CS}_2$  was unexpectedly improved when the  $\text{Na}_2\text{O}$  range was limited to 1,200 to 2,500 ppm.

### **Deficiencies of Goodboy**

Goodboy discloses a Claus catalyst in the form of activated alumina in which the sodium oxide concentration is stated to broadly range from 0.1 to 2.5 wt% but with 0.50

to 2.5 wt% being preferred (column 3, lines 54-60 of Goodboy). In fact, Goodboy discloses that Bayer trihydrates containing 0.4 wt% Na<sub>2</sub>O are particularly advantageous "because the relatively high Na<sub>2</sub>O content required in the catalyst of the [Goodboy] invention can be easily achieved" (Goodboy at column 5, lines 13-40). Example 1 of Goodboy includes 1 wt% (10,000 ppm) Na<sub>2</sub>O and the examples in Table 1 of Goodboy include various Na<sub>2</sub>O contents but none of the contents recited in Goodboy's Table 1 falls within the claimed range. As such, Goodboy fails to teach each and every limitation recited in Claim 1. See Hybritech, supra, and Gore, supra. Instead, in order to produce the claimed Na<sub>2</sub>O range it is necessary to select a narrow and nonpreferred portion of Goodboy's Na<sub>2</sub>O range. Accordingly, Goodboy clearly fails to anticipate the claimed invention and the rejection should be withdrawn.

### **The §103 Rejection**

Claims 1-15 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Goodboy in view of U.S. Patent No. 5,244,648 ("Dupin") or U.S. Patent No. 3,856,708 ("Carithers"). This rejection is respectfully traversed for the following reasons.

### **Legal Standard For Overcoming §103 Rejections**

As pointed out by the court in In re Soni, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995), "when an Applicant demonstrates *substantially* improved results, as Soni did here, and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence of* evidence to the contrary." With respect to optimization, in In re Antonie, 195 USPQ 6, 8 (CCPA 1977), the court stated that:

The PTO and the minority appear to argue that it will always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized that particular parameter effected the result. As we have said many times, obvious to try is not the standard of 35 U.S.C. §103. (Emphasis in original.) Antonie, at 8.

The court in Antonie also stated that while the discovery of an optimum of a variable in a known process is normally obvious, there are two exceptions to the rule. The first exception is when the results of optimizing a variable, which was known to be result effective, were unexpectedly good. The second exception is in the case where the parameter optimized was not recognized to be a result-effective variable. In the present case, Goodboy provides no recognition that the Na<sub>2</sub>O content would be effective in providing improved CS<sub>2</sub> conversion rates. Moreover, the attached Exhibit I shows that the claimed Na<sub>2</sub>O range produces unexpected improvement in CS<sub>2</sub> conversion in comparison to the closest examples of Goodboy.

#### **Showing of Unexpected Results**

Exhibit I shows the corresponding CS<sub>2</sub> conversion rate for the closest Na<sub>2</sub>O examples of Goodboy compared to the claimed 1,200 to 2,500 ppm Na<sub>2</sub>O range. As explained above, Goodboy fails to disclose any examples falling within the claimed range for the Na<sub>2</sub>O content. Exhibit I corresponds to the figure of Applicants' specification and shows that the claimed 1,200 to 2,500 ppm Na<sub>2</sub>O content provides new and unexpected results with respect to CS<sub>2</sub> conversion. Exhibit I shows the Na<sub>2</sub>O contents of Goodboy's Examples 6, 8 and 9 wherein the Na<sub>2</sub>O contents are 0.09 wt% (900 ppm), 0.1 wt%

(1,000 ppm) and 0.33 wt% (3,300 ppm), respectively. In view of the showing of unexpected results in the specification (as reproduced in Exhibit I), it is submitted that any prima facie case of obviousness based on Goodboy has been rebutted. As the secondary references (Dupin and Carithers) are only relied on for features other than the Na<sub>2</sub>O content, no further discussion thereof is deemed necessary.

**Conclusion**

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited.

Respectfully submitted,

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